

We claim:

- 1 1. A computer implemented method comprising:
  - 2 receiving a subscriber session with a first tunneling protocol; and
  - 3 switching the subscriber session out a second tunneling protocol.
- 1 2. The method of claim 1 wherein the subscriber session is a set of packets originating from a subscriber.
- 1 3. The method of claim 1 wherein switching the subscriber session comprises:
  - 2 determining the subscriber session is to be transmitted with the second tunneling protocol;
  - 3 encapsulating the subscriber session with the second tunneling protocol; and
  - 4 transmitting the encapsulated subscriber session.
- 1 4. The method of claim 1 wherein the first tunneling protocol can be a compulsory or voluntary protocol.
- 1 5. The method of claim 1 wherein the second tunneling protocol is a compulsory protocol.
- 1 6. A computer implemented method comprising:
  - 2 receiving a session encapsulated with a first tunneling protocol, the session having a control message;
  - 3 decapsulating the control message;
  - 4 using the control message to determine if the session is to be transmitted with a second tunneling protocol;
  - 5 if the session is to be transmitted with the second tunneling protocol,

8           creating a session structure indicating the second tunneling protocol associating the  
9           session with the session structure; and  
10           transmitting the session as indicated by the session structure.

1       7. The method of claim 6 wherein using the control message to determine if the session  
2       is to be transmitted with the second tunneling protocol comprises:  
3           retrieving a subscriber record;  
4           the record corresponding to the subscriber indicated by the control message;  
5           determining if the record indicates the subscriber is to be tunneled out; and  
6           if so, the record indicating the second tunneling protocol.

1       8. The method of claim 6 wherein associating the session to the session structure  
2       comprises processing the session as indicated by the session structure.

1       9. A computer implemented method comprising:  
2           receiving a subscriber session with a first tunneling protocol;  
3           determining that the subscriber session is to be transmitted with a second tunneling  
4           protocol;  
5           associating the subscriber session with a session structure, the session structure  
6           indicating the second tunneling protocol; and  
7           transmitting the subscriber session as indicated by the session structure.

1       10. The method of claim 9 wherein determining if the subscriber session is to be  
2       transmitted with a second tunneling protocol comprises:  
3           retrieving a set of data corresponding to the subscriber session, the set of data  
4           indicating the subscriber session is to be tunneled out.

1 11. The method of claim 9 wherein associating the subscriber session with the session  
2 structure comprises processing the subscriber session as indicated by the session structure.

1 12. A computer implemented method comprising:  
2 receiving a subscriber session encapsulated with a first of a plurality of tunneling  
3 protocols;  
4 determining that the subscriber session is to be transmitted with a second of the  
5 plurality of tunneling protocols;  
6 creating a session structure, the session structure indicating the second of the plurality  
7 of tunneling protocols; and  
8 transmitting the subscriber session as indicated by the session structure.

1 13. The method of claim 12 wherein the first of the plurality of protocols can be a  
2 compulsory or voluntary tunneling protocol.

1 14. The method of claim 12 wherein the second of the plurality of protocols is a  
2 compulsory tunneling protocol.

1 15. The method of claim 12 further comprising determining whether the second of the  
2 plurality of tunneling protocols is supported locally, and to access the second of the plurality  
3 of protocols from a remote server if not supported locally.

1 16. A network element comprising  
2 a circuit to receive a session, the session being encapsulated with a first tunneling  
3 protocol;  
4 a logic to determine if the session is to be transmitted with a second tunneling  
5 protocol,

6 to encapsulate the session with the second tunneling protocol if the logic  
7 determines that the session is to be transmitted with the second  
8 tunneling protocol; and  
9 to transmit the session.

1 17. The network element of claim 16 wherein the logic to determine if the session is to be  
2 transmitted with the second tunneling protocol comprises:  
3 a control module to retrieve a set of data corresponding to the session, the set of data  
4 indicating the session is to be tunneled out; and  
5 a tunnel module to associate the session to a session structure, the session structure  
6 indicating the second tunneling protocol.

1 18. The network element of claim 16 wherein the first tunneling protocol can be a  
2 compulsory or voluntary tunneling protocol.

1 19. The network element of claim 16 wherein the second tunneling protocol is a  
2 compulsory tunneling protocol.

1 20. A network element comprising:  
2 a tunnel decapsulation module to decapsulate a session received over an ingress  
3 tunnel according to a first or a plurality of protocols;  
4 a payload decapsulation module coupled to said tunnel decapsulation module to  
5 decapsulate a control packet that is part of said session;  
6 a control process coupled to said payload decapsulation module to determine if said  
7 session is to be transmitted over an egress tunnel that uses one of said plurality  
8 of protocols;

9           a tunnel module, coupled to said tunnel encapsulation module and said control  
10           process, to encapsulate the traffic from said session in the one of said plurality  
11           of protocols used for said egress tunnel.

1   21.   The network element of claim 20, wherein:  
2           said control process to also determine whether the one of said plurality of protocols  
3           used for said egress tunnel is stored locally, and to access the one of said  
4           plurality of protocols from a remote server if the one of said plurality of  
5           protocols is not stored locally.

1   22.   The network element of claim 20, wherein said tunnel module includes at least two of  
2           said plurality of protocols.

1   23.   An apparatus comprising:  
2           a first network card to receive a set of data, the set of data being encapsulated with a  
3           first tunneling protocol; and  
4           a computer to determine if the set of data is to be transmitted with a second tunneling  
5           protocol and to encapsulate the set of data with the second tunneling protocol  
6           if determined the set of data is to be transmitted with the second tunneling  
7           protocol; and  
8           a second network card to transmit the encapsulated set of data.

1   24.   The apparatus of claim 23 wherein the first tunneling protocol can be a voluntary or  
2           compulsory tunneling protocol.

1   25.   The apparatus of claim 23 wherein the second tunneling protocol is a compulsory  
2           tunneling protocol.

1       26.    A machine readable medium that provides instructions, which when executed by a set  
2        of processors, cause said set of processors to perform operations comprising:  
3            receiving a subscriber session with a first tunneling protocol; and  
4            switching the subscriber session out a second tunneling protocol.

1       27.    The machine readable medium of claim 26 wherein switching comprises:  
2            determining the subscriber session is to be transmitted with the second tunneling  
3            protocol;  
4            encapsulating the subscriber session with the second tunneling protocol; and  
5            transmitting the encapsulated subscriber session.

1       28.    The machine readable medium of claim 26 wherein the first tunneling protocol can be  
2        a compulsory tunneling protocol or voluntary tunneling protocol.

1       29.    The machine readable medium of claim 26 wherein the second tunneling protocol  
2        is a compulsory tunneling protocol.